



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/611,627	06/30/2003	Yimin Hsu	SJO920010015US2	1391

7590 11/16/2004
Hitachi Global Storage Technologies
NHGB/0142
5600 Cottle Road
San Jose, CA 95193

EXAMINER

KLIMOWICZ, WILLIAM JOSEPH

ART UNIT	PAPER NUMBER
2652	

DATE MAILED: 11/16/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/611,627	Applicant(s) HSU ET AL.	
	Examiner William J. Klimowicz	Art Unit 2652	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 30 June 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-7, 11-15, 18-24, 30-40 and 46-52 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-7, 11-15, 18-21, 30-37 and 46-49 is/are rejected.
- 7) ☒ Claim(s) 22-24, 38-40 and 50-52 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 30 June 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Preliminary Amendment

Claims 8-10, 16, 17, 25-29, 41-45 and 53-57 have been cancelled by the Applicant in this application.

Claims 1-7, 11-15, 18-24, 30-40 and 46-52 are currently pending.

Claim Objections

Claims 1, 3, 11, 18, 19, 30, 33, 39, 46 and 47 are objected to because of the following informalities:

Claim 1 should be modified to include the phrase --A magnetic head assembly, comprising:-- since claims 2-4, which depend therefrom, each recite in their respective preambles "A magnetic head assembly as claimed..."

With regard to claim 1 (line 2), claim 11 (line 5) and claim 30 (line 4), the phrase "the yoke region" should be changed to the phrase -- a yoke region -- or at least be properly introduced prior to its recitation in lines 52, 5 and 4 of claims 1, 11 and 30, respectively.

With regard to claim 1 (line 4), claim 19 (line 2-3) and claim 47 (line 3), the phrase "the ABS" should be changed to the phrase -- an ABS -- or at least be properly introduced prior to its recitation in line 4 of claim 1 and line 2-3 of claim 19 and line 3 of claim 47.

With regard to claim 1 (line 12), claim 11 (line 15-16) and claim 30 (line 14-15), the phrases "the front region" and "the back gap region" should be changed to the phrases -- a front

Art Unit: 2652

region -- and -- a back gap region--, respectively, or at least be properly introduced prior to its recitation in lines 12, 15-16 and line 14-15 in claims 1, 11 and 30, respectively.

Lines 11-12 of claim 3 should be deleted since they are duplicative of lines 9-10 of claim 3.

With regard to claim 11 (line 27-28), the phrase “the magnetic head assembly” should be changed to the phrase -- a magnetic head assembly -- or at least be properly introduced prior to its recitation in line 27-28.

With regard to claim 11 (third to last line), the phrase --positioning means-- should be inserted after the word “actuator” to maintain claim language consistency.

With regard to claim 18 (line 29) and claim 46 (line 28), the phrase “the write head” should be changed to the phrase -- a write head -- or at least be properly introduced prior to its recitation in line 29.

With regard to claim 18 (line 33) and claim 46 (line 33), the phrase “the pedestal” should be changed to the phrase -- the pole tip component -- since the dielectric third insulation layer (designator 226 in FIG. 10A), as described in the specification, lies between the second pole piece ferromagnetic pole tip component (216 in FIG. 10A) and the back gap component (218 in FIG. 10A).

With regard to claim 33 (line 1-2), the phrase “the first and second coplanar surfaces are” should be changed to the phrase -- the first coplanar surface is-- since the second coplanar surface has yet to be previously recited in the claim language, or the second coplanar surface should be properly introduced prior to its recitation in line 1-2 of claim 33.

Art Unit: 2652

With regard to claim 39 (line 2), the phrase "the front and back gap components" should be changed to the phrase -- the pole tip and back gap components -- in order to maintain claim language consistency.

With regard to claim 46 (line 20), the phrase "the pole tip pedestal" should be changed to the phrase -- the ferromagnetic pedestal -- in order to maintain claim language consistency.

With regard to claim 46 (line 28), the phrase "the write head" should be changed to the phrase -- a write head -- or at least be properly introduced prior to its recitation in line 28.

With regard to claim 46 (line 33), the word "first" should be deleted in order to maintain claim language consistency.

Appropriate correction is required.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-7, 18-21, 30-33, 35-37 and 46-49 are rejected under 35 U.S.C. 102(e) as being anticipated by Sasaki (US 6,317,288 B1).

As per claims 1 and 30, Sasaki (US 6,317,288 B1) discloses a magnetic head assembly and method of making such magnetic head (e.g., FIG. 8A), having a yoke region between front and back gap regions wherein the front region terminates at an air bearing surface (ABS) (left

Art Unit: 2652

vertical side of head as seen in FIG. 8A), comprising: first (18, 19a, 19b) and second (23a, 25, 23b) pole pieces; first (21) and second (24) coil layers in the yoke region; the second pole (23a, 25, 23b) piece having a ferromagnetic pole tip component (23a) which forms a portion of the ABS and defines a track width of a write head (FIG. 8B); a write gap layer (22) located between the first pole piece (18, 19a) and the pole tip component (23a); a dielectric first insulation layer (20c) interfacing first and second side surfaces and a back surface of the pole tip component (23a) (e.g., see FIGS. 6A, 6B) and located between the first (21) and second (24) coil layers; and the second pole piece (23a, 25, 23b) having a ferromagnetic second pole piece structure (e.g., (25))) extending across the second coil layer (24) and magnetically connected to the pole tip component (23a) in the front region and the first pole piece (18, 19a, 19b) in the back gap region (via 23b). FIG. 8A.

As per claims 2 and 31, the first insulation layer (20c) is composed entirely of alumina (e.g., see COL. 14, lines 12-13).

As per claims 3 and 32 (and also claim 12, rejected under 35 USC 103(a), *infra*), the first pole piece (18, 19a, 19b) having a ferromagnetic pedestal (19a) in the front region and a back gap component (19b) in the back gap region; the first coil layer (21) being located between the pedestal (19a) and the back gap component (19b) of the first pole piece 918, 19a, 19b); a dielectric second insulation layer (20b) insulating the first coil layer (21); the pedestal (19a) and back gap (19b) components of the first pole piece (18, 19a, 19b), the first coil layer (21) (**as per claim 21 and claim 49**) and the second insulation layer (20b) forming a first coplanar surface (FIG. 5A); and the write gap layer (22) being located between the pedestal (19a) and the pole tip component (23a).

As per claims 4 and 35 (and also claim 13, rejected under 35 USC 103(a), *infra*), the second pole piece (23a, 25, 23b) having a ferromagnetic back gap component (23b) magnetically connected to the back gap component (19b) of the first pole piece (18, 19a, 19b); the first insulation layer (20c) being located between the pole tip (23a) and back gap (23b) components of the second pole piece; and the pole tip (23a) and back gap (23b) components of the second pole piece and the first insulation layer (20c) forming a second coplanar surface (i.e., including the uppermost portions of (20c) - see FIG. 7A).

As per claims 5 and 36 (and also claim 14, rejected under 35 USC 103(a), *infra*), the second pole piece (23a, 25, 23b) having a ferromagnetic second pole piece structure (25) that is magnetically connected to the pole tip (23a) and back gap (23b) components of the second pole piece and that extends across the second coil layer (24); and a dielectric third insulation layer (20d) insulating the second coil layer (24) from the second pole piece structure (25).

As per claims 6, 20, 37 and 48, (and also claim 15, rejected under 35 USC 103(a), *infra*), wherein the second pole piece structure is a single layer (25).

As per claim 7, Sasaki (US 6,317,288 B1) further discloses a read head including: a sensor (15); nonmagnetic nonconductive first and second read gap layers (15a); the sensor (15) being located between the first and second read gap layers (14, 17 - FIG. 2A, 2B); a ferromagnetic first shield layer (13); and the first and second read gap layers (14, 17) being located between the first shield layer (13) and the first pole piece layer (18).

Art Unit: 2652

As per claims 18 and 46, Sasaki (US 6,317,288 B1) discloses the magnetic head assembly and manufacture thereof (FIGS. 8A, 8B) partially bounded by a top surface, a bottom surface and a front surface that forms a portion of an air bearing surface comprising: first (18, 19a, 19b) and second (23a, 25, 23b) pole pieces; the first pole piece having a ferromagnetic first pole piece layer (18) having front, middle and back portions with the middle portion located between front and back portions; the first pole piece further having the ferromagnetic pedestal (19a) magnetically coupled to the front portion of the first pole piece layer (18) and the ferromagnetic back gap component (19b) magnetically coupled to the back portion of the first pole piece layer (25) with the middle portion of the first pole piece layer located between the pedestal (19a) and the back gap component (19b); a dielectric first insulation layer (20a) on the middle portion of the first pole piece layer (25); a first coil layer (21) located on the first insulation layer (20a) which has spaced apart turns and which is spaced from each of the pedestal and the back gap component; a dielectric second insulation layer (20b) located between the turns of the first coil layer (21) and between the first coil layer (21) and each of the pedestal (19a) and the back gap component (19b); the pedestal (19a), the second insulation layer (20b) and the back gap component (19b) having top surfaces which form a first coplanar surface (FIG. 5A, 5B); the first coplanar surface having front, middle and back portions with the middle portion located between front and back portions (FIG. 5A, 5B); the nonmagnetic write gap layer (22) located on the front and middle portions of the first coplanar surface (FIGS. 5A, 5B); the write gap layer (22) having front and rear portions; the second pole piece (23a, 25, 23b) having a ferromagnetic pole tip component (23a) which is located on the front portion of the write gap layer (22) and which has a width that defines a track width of the write head (FIG. 6B); the second pole piece

Art Unit: 2652

(23a, 25, 23b) further having a ferromagnetic back gap component (23b) magnetically coupled to the back gap component (19b) of the first pole piece; a dielectric third insulation layer (20c) located on the rear portion of the write gap layer (22) in a space between the pedestal (23a) and the first back gap component (23b) of the second pole piece; the pole tip component (23a), the third insulation layer (i.e., uppermost portion of 20c) and the back gap component (23a) of the second pole piece having top surfaces which form a second coplanar surface (FIGS. 7A, 7B); the second coplanar surface having front, middle and back portions with the middle portion located between the front and back portions (FIGS. 7A, 7B); a second coil layer (24) located on the middle portion of the second coplanar surface (FIG. 8A); the second pole piece having a second pole piece structure (25) located over the second coil layer (24) and magnetically connected to the pole tip component (23a) at the front portion of the second coplanar surface and magnetically connected to the back gap component (23b) of the second pole piece at the back portion of the second coplanar surface; and a dielectric fourth insulation layer (20d) located between the turns of the second coil layer (24) and between the second coil layer (24) and the second pole piece structure (25).

As per claims 19 and 47, the pole tip component (23a) having first and second side walls that intersect the ABS (FIGS. 8A, 8B); and the third insulation layer (20c) interfacing the first and second side walls of the pole tip component (23a).

As per claim 33, wherein the first and second coplanar surfaces are formed by chemical mechanical polishing (e.g., see, *inter alia*, COL. 13, lines 35-40).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 11-15 and 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sasaki (US 6,317,288 B1).

See the discussion of Sasaki (US 6,317,288 B1), *supra*.

Additionally, as per claim 11, Sasaki (US 6,317,288 B1) further discloses a read head including: a sensor (15); nonmagnetic nonconductive first and second read gap layers (15a); the sensor (15) being located between the first and second read gap layers (14, 17 - FIG. 2A, 2B); a ferromagnetic first shield layer (13); and the first and second read gap layers (14, 17) being located between the first shield layer (13) and the first pole piece layer (18).

As per claim 11, Sasaki (US 6,317,288 B1) discloses all the claimed features (see claims previously discussed, *supra*), but does not expressly show the magnetic head in a disk drive, including conventional structure provided therein including a housing; a magnetic disk rotatably supported in the housing; a support mounted in the housing for supporting the magnetic head; a spindle motor for rotating the magnetic disk; an actuator positioning means connected to the support for moving the magnetic head to multiple positions with respect to said magnetic disk; and a processor connected to the magnetic head, to the spindle motor and to the actuator

Art Unit: 2652

positioning means for exchanging signals with the magnetic head, for controlling movement of the magnetic disk and for controlling the position of the magnetic head.

Official notice is taken that magnetic disk drives including the conventional structure as set forth in claim 11 are notoriously old and well known and ubiquitous in the art; such Officially noticed fact being capable of instant and unquestionable demonstration as being well-known.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the magnetic head of Sasaki (US 6,317,288 B1) within a conventional disk drive as set forth in claim 11.

The rationale is as follows: one of ordinary skill in the art would have been motivated to provide the magnetic head of Sasaki (US 6,317,288 B1) within a conventional disk drive as set forth in claim 11 in order to provide the advantages of the head, espoused by Sasaki (US 6,317,288 B1) (e.g. precisely controlled throat height) within a conventional disk drive.

As per claims 12-15, see the discussion of Sasaki (US 6,317,288 B1) in the rejection under 35 USC 102, *supra*.

As per claim 34, although Sasaki (US 6,317,288 B1) does not expressly show wherein the second insulation layer (20b) is formed **before** forming the pedestal (19a) and back gap component (19b) of the first pole piece, it would have been obvious to one of ordinary skill in the art at the time the invention was made to reverse the order of processing steps of Sasaki (US 6,317,288 B1) in the manner prescribed by claim 34.

The rationale is as follows: it would have been obvious to one of ordinary skill in the art at the time the invention was made to reverse the order of processing steps of Sasaki (US 6,317,288 B1) in the manner prescribed by claim 34 in order to minimize damage to the pedestal

Art Unit: 2652

and back gap components, by forming the pedestal and back gap components **after** formation of insulation layer (20b).

No new or unobvious result is seen to be obtained by reversing the method steps of Sasaki (US 6,317,288 B1) given the knowledge of one having ordinary skill in the art.

Allowable Subject Matter

Claims 22-24, 38-40 and 50-52 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

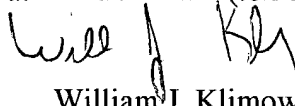
The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to William J. Klimowicz whose telephone number is (703) 305-3452. The examiner can normally be reached on Monday-Thursday (6:30AM-5:00PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hoa T. Nguyen can be reached on (703) 305-9687. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Art Unit: 2652

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


William J. Klimowicz
Primary Examiner
Art Unit 2652

WJK